Description of some new genera and species of North American LIMNOBINA.

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PART I.

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Since my previous publications on North American Limnobina (in the *Proc. Acad. Nat. Sc. Phil.*, 1859 and 1861) I have been gradually collecting materials for a new and more complete work on the same subject, which, together with the work of Mr. Loew on *Tipulina*, was intended to form the third volume of the *Monographs on the North American Diptera*. This volume would have thus contained a complete monograph of the family of *Tipulidæ*. My manuscript was already sent to the Smithsonian Institution in Washington, to be accepted for publication, when it was lost during the late fire in the building of that Institution. Unfortunately, I had retained no copy. Anticipating a voyage to Europe early in the spring, I had hoped to see the manuscript go through the press before that time, and hurrying to get it ready, did not stop to have it copied, which would have involved a loss of several weeks. Except the fragments which I publish here, I have absolutely nothing in hand now, and the whole work will have to be done over again, including many observations on the structure of the genital organs, of the antennæ and palpi, etc., made on living specimens and written down on scraps of paper, which I, for the most part, (very imprudently) destroyed, as soon as the contents had been incorporated in the text.

So much as an explanation of the delay which will probably occur before I will be able to replace the lost manuscript. In the meantime, I intend to publish here a small portion of it, which I had kept back for the sake of some additions, and which thus escaped destruction. I will also add notices on the new genera of *Limnobina*, discovered in this country since my last publications, and short descriptions of the most remarkable of the new species.

The subdivisions, provisionally introduced by me in my first paper on *Limnobina* (Proc. Acad. N. S. Phil. 1859), were retained in the new monograph, as the following table shows:—

SECTION LIMNOBINA.

I. *A single marginal cell.*

Antennæ 14-jointed.

I. **Limnobiæformia.**

1. Geranomyia.
2. Rhipidia.
3. Dicranomyia.
4. Discobola.
5. Limnobia.

Antennæ 16-jointed, (or sometimes, through the coalescence of the basal joints of the flagellum, 15- or 12-jointed; in such cases, the *proboscis enormously prolonged.*)

II. **Anomala.**

a. *Rhamphidiæformia.*
   6. Rhamphidia.
   7. Elephantomyia.
   8. Toxorhina.
b. *Cylindrotomæformia.*
   9. Cylindrotoma.
   10. Triogma.
   11. Phalacrocera.
c. *Anomala vera.*
   12. Dicranoptycha.
   13. Antocha.
   14. Teucholabis.
   15. Plectromyia *nov. gen.*
   16. Elliptera *Schiner* (European genus, unknown to me).

II. *Two marginal cells.*

No spurs at the tip of the tibiæ.

III. **Eriopteræformia.**

17. Erioptera.
18. Symplecta.
19. Trimicra.
20. Gnophomyia.
21. Cryptolabis.
22. Cladura.
23. Gonomyia.

Tibiæ with spurs at the tip.

Auxiliary cross-vein *posterior* to the origin of the second vein.

Antennæ 16-jointed.

IV. **Limnophilæformia.**

24. Epiphragma.
25. Limnophila.
26. Trichocera.

Antennæ 6- or 10-jointed.

V. **Anisomeræformia.**

27. Anisomera.
28. Eriocera.
29. Penthoptera.

Auxiliary cross-vein *anterior* to the origin of the second vein.

VI. **Pediciæformia.**

30. Amalopis.
31. Pedicia.
32. Ula.
33. Dicranota.
34. Astrolabis nov. gen.
35. Rhaphidolabis nov. gen.
36. Tricyphona (European genus, unknown to me).

At the same time, these subdivisions were better defined and their relations to each other more clearly established, than was done in 1859. Among the introduced innovations, the most important were the following:—

1. The genus *Limnobia*, as defined in my first paper, was broken up now in the genera: *Geranomyia*, *Rhipidia*, *Dicranomyia*, *Limnobia* and *Discobola*. The last genus comprises the European *Limnobia annulata* Lin. and the American *L. argus* Say, both distinguished by a supernumerary cross-vein between the sixth and seventh longitudinal veins.

2. The genera *Cylindrotoma*, *Triogma* and *Phalacrocera*, all new for North America, were located in the artificial tribe of *Limnobina anomala*, which was subdivided in three *groups* as follows:

   a. *Rhamphidiæformia*.
   b. *Cylindrotomæformia*.
   c. *Anomala*.

3. The name of *Limnobiorhynchus* Westw. was dropped for the present, and that for reasons to be shown hereafter, and the generic name of *Toxorhina* Loew was resumed. A new genus, *Plectromyia* was added to the group c. (*Anomala vera.*)

4. *Epiphragma* nob. was altogether separated from *Limnophila*.

5. The genus *Arrhenica* was united with *Eriocera*, under the latter name, as the distinctions, previously established between the two genera were found to be insufficient. Thus *Eriocera* will contain now species with long and with short male antennæ, similar in this to the related genus *Anisomera*, which likewise contains two groups of species, based on the same character.

6. The genus *Penthoptera*, recently introduced by Schiner (*Fauna Austriaca*, *Diptera*, II, p. 534) was found to occur in the United States and consequently admitted. Its relationship to *Eriocera* is very close and the differences are not easily defined; they principally consist in the proportionally much more elongated cells of the apical portion of the wing. The ♀ antennæ of this genus, which I have had occasion to count on a living specimen, are ten-jointed.

7. Two new genera *Astrolabis* and *Rhaphidolabis* were introduced among the *Limnobina pediciæformia*.

The terminology used in my former paper, especially with reference to the neuration of the wings, was abandoned, and that adopted by Mr. Loew in his publications introduced in its stead.

I. TOXORHINA, CYLINDROTOMA, TRIOGMA AND PHALACROCERA.

The fragment of my manuscript above alluded to and which escaped destruction, begins with the *Toxorhina*, the last genus among the *Limnobina rhamphidiæformia* and comprises the whole of the *Limnobina cylindrotomæformia.* It is given here without any change, except the omission of the references to the figures of the wings, which were to illustrate the descriptions.

Gen. VIII. **TOXORHINA.**

Characters.—One marginal cell; *no submarginal,* a discal, and four posterior cells; no stigmatical cross-vein. *Proboscis very long, longer than head and thorax taken together;* palpi exceedingly minute, inserted at its tip. Antennæ very short, 12-jointed; basal joint of the flagellum very stout; *the two apical joints only are provided with several long bristles.* Thorax elongated, extended anteriorly into a long, cylindrical neck; mesonotum strongly projecting over the collare; metanotum long, horizontal. Tibiæ without spurs at the tip. Empodia indistinct or none.

The *head* is proportionally very small.

The *antennæ* are 12-jointed, hardly longer than the head; the first joint is very short, and still shorter in the male than in the female; the second is longer and much stouter than the first, obconical; the third is incrassated, although less stout than the second joint; it seems to represent the coalescence of several joints; it is more or less rounded in the male, and more elongated, almost conical in the female; the remainder of the antenna is filiform; the two apical joints in the male are elongated, slender, and considerably longer than the preceding joints, a difference which is not so striking in the female; the intermediate joints are cylindrical, those nearer to the stout basal joint of the flagellum are sometimes very short and broader than long; the two joints of the scapus bear some short bristles; the pubescence of the flagellum is almost imperceptible; the two apical joints only bear some long bristles, very characteristic for the genus.

The *front* is narrow in *T. magna* and broader in *T. muliebris;* the *eyes* are slightly emarginate on the inside, to leave room for the insertion of the antennæ and very closely approximated, almost contiguous, on the underside of the head.

The *palpi*, inserted at the tip of the proboscis, are exceedingly minute and their joints seem to be almost coalescent; (compare, as to the structure of the palpi of this genus, Mr. Loew's figures, Linn. Entom. V. Tab. II, f. 19, 20, 21.)

The *proboscis* is slender, perfectly linear, with an almost imperceptible pubescence; both species described below have it about once and a half the length of the head and thorax taken together.

The *thorax* is rather long, and remarkable for the great and unusual development of the mesosternum, in consequence of which the fore coxæ are at a considerable distance from the intermediate ones; the collare is entirely concealed under a projecting gibbosity of the mesonotum; on the underside, the prothorax is extended into a long, narrow, cylindrical neck, to which the head is fastened; the metanotum is also much developed, rather long and horizontal.

The *feet* are long and slender; their pubescence hardly perceptible; the last joint of the tarsi of the male shows on the underside, at the basis, the excision characterizing the male sex in many genera. The tibiæ have no spurs at the tip, and the empodia are imperceptible.

The *wings* are rather short for the size of the body, and not broad.

The first longitudinal vein joins the costal very early and very soon beyond the origin of the second longitudinal vein; the mode of this junction of the first vein with the costa is also peculiar; instead of running parallel to the costa and then taking a sudden turn towards it, (as in most *Limnobina*), the first vein gradually converges towards the costa and finally coalesces with it, so that, beyond their junction, the costa becomes much stouter. The auxiliary vein is very closely approximated to the first longitudinal and ends in the costa almost opposite the origin of the second vein; the auxiliary cross-vein is not far from its tip; there is no vestige of a stigmatical cross-vein. *There is no submarginal cell, as the second longitudinal vein does not emit any other vein;* the first posterior cell follows immediately after the marginal cell. The more correct view of this neuration would perhaps be to consider the section of the second vein, lying beyond the small cross-vein, as the third vein, thus assuming that the exterior section of the second vein, and not the third vein is obliterated. However, for brevity's sake, I have called the whole vein, *second longitudinal vein.* The fourth vein starts, as usual, from the fifth, very near the basis of the wing, being slightly arcuated at its origin, and connected at this place with the first vein by a small, but very distinct, cross-vein. A thickening of the alar membrane almost always exists at this place in the *Limnobina;* sometimes it assumes the appearance of a vein; in the present case, however, this cross-vein is particularly distinct, because the origin of the fourth vein is a little more distant than usual from the basis of the wing. Of the two branches of the fourth vein, the posterior one is forked, and a cross-vein between this fork and the anterior branch closes the discal cell.

The sixth vein is very closely approximated to the fifth for more than one-third of its course, and then suddenly diverges at an acute angle from it; in some specimens the basal portions of these veins are so near each other as to appear coalescent; a careful examination, however, always proves that they run alongside of each other. The seventh vein is nearly straight.

The *forceps* of the male, as far as its structure can be ascertained on a dry specimen, seems to be somewhat like that of *Elephantomyia*, that is, it consists of a pair of subcylindrical basal pieces, to which two pairs of ensiform, horny appendages are attached. The *ovipositor* of the female has long, slender, almost imperceptibly arcuated valves.

The relationship of *Toxorhina* with *Elephantomyia* and *Rhamphidia* is evident, and principally indicated by the prolonged proboscis, common to the three genera, the absence of the stigmatical cross-vein and the structure of the feet.

Toxorhina is easily distinguished from *Elephantomyia* by the neuration of the wings, the submarginal cell of which is wanting; by the structure of the antennæ, which are 12-jointed and have some longer bristles on the apical joints only, whereas *Elephantomyia* has long verticils on all the joints, and by the structure of the thorax, the collare being entirely concealed under the projecting gibbosity of the mesonotum, the mesosternum being unusually developed, and the metanotum also very large and horizontal.

[At this place a blank was left in my manuscript, in the expectation of an answer from Mr. Loew about the vexed question of the identity or diversity of *Toxorhina* Lw. and *Limnobiorhynchus* Westw. I have discussed this question in the *Proc. Acad. N. S. Phil.* 1859, p. 221, and have reached the conclusion of the identity of these two genera. Since then, the discovery of the two North American species, to be described below and an important statement of Mr. Loew, in a private letter, about his article on *Toxorhina* (in *Linn. Ent.* V) have led me to change my opinion. We have to recollect that, in this article, Mr. Loew united in the genus *Toxorhina* a single living species, from Porto-Rico, and three fossil species. Of the former, he had only a female, which he figured. The figure shows that the wings have no submarginal cell. As nothing was said in the description, either about the sex or about the neuration of the fossil species, it could be reasonably inferred that the fossil species, like *T. fragilis*, have no submarginal cell. Such, however, is not the case. In answer to my inquiry about this point, Mr. Loew informs me now that all his fossil specimens of *Toxorhina* are males, and that *all have a submarginal cell.* Before the discovery of a N. A. species, showing *the same neuration* (without submarginal cell) *in both sexes*, this statement of Mr. Loew would have perhaps confirmed me in the opinion that *Toxorhina* and *Limnobiorhynchus* are synonymous, as the most striking character ascribed by Mr. Westwood to the latter genus is the disparity of the neuration in both sexes. Since we possess the N. A. *Toxorhina magna* (♂ ♀), which agrees in all points with *T. fragilis* Lw. (♀), so much so that there is no reason whatever to doubt of their belonging to the same genus, it becomes extremely probable that the male of *T. fragilis* has the same neuration as the female, that is, no submarginal cell; and as a corollary from this, it becomes evident that the three fossil species, known in the male sex only, and possessing a submarginal cell, belong to a different genus. It being thus shown that two genera have been inadvertently united by Mr. Loew under the name of *Toxorhina*, it remains to be decided which of them has a right to this name? The name of *Toxorhina* made its first appearance in connection with the fossil species only, (Loew, *Bernstein* u. *Bernsteinfauna*, 1850), but no description whatever was attached to it at that time. At its second appearance (*Linnæa Entom.* l. c.) it became indissolubly connected with the living species *T. fragilis*, of which a full description and an excellent figure were given. The fossil species were only incidentally mentioned, and moreover, as has been already shown above, an erroneous impression concerning them was introduced, as if they had no submarginal cell. Thus, the name of *Toxorhina* being connected with the species *fragilis* by a full description and a figure, whereas no description, or, if any, an incorrect statement, establish the claim of the three fossil species upon this name, it seems evident that *Toxorhina fragilis* has to retain its present generic appellation. In giving the detailed description of the genus, I have acted upon this conclusion, as well as on the presumption that the two N. A. species belong to the same genus with *T. fragilis*. The fact that there is no disparity in the neuration of the two sexes of *Toxorhina* at once discards its supposed identity with *Limnobiorhynchus*.

To what genus, then, do the three fossil species belong? The data in our possession are not sufficient to solve this question. If the as yet unknown females of these species agree in their neuration with the males, that is, if they have a submarginal cell, it is not impossible that these species belong to *Elephantomyia*. On the contrary, if these females have no submarginal cell, said species may belong to *Limnobiorhynchus*. I incline to believe, that the females of the fossil species have the same neuration as the males, and that they belong either to *Elephantomyia* or to a closely allied genus. But I go further than this, and *strongly suspect that a genus like* LIMNOBIORHYNCHUS *Westw.*, *with such an important difference in the neuration of the male and of the female, has no existence at all*, and that Westwood has united in one genus the male sex of *Elephantomyia* and the female of *Toxorhina*, having probably been induced by the enormously prolonged proboscis of both genera, to form a premature conclusion as to their generic identity.

Even *a priori* the existence of a genus the male sex of which differs so much from the female in its neuration, seems very improbable. But if we scrutinize with some attention Westwood's description of *Limnobiorhynchus*, we will discover in this very description strong proofs confirmatory of my supposition, that this genus was based upon male specimens of one genus and female ones of another. In order to enable the reader to judge for himself, I have reproduced below Westwood's description of *Limnobiorhynchus*, which may be inaccessible to many.* It will be seen that all the characters which the author attributes to the male sex (14-jointed antennæ, presence of a submarginal cell and of a stigmatical spot), may be rather referred to *Elephantomyia*. All the characters which he ascribes to the female (12-jointed, very short antennæ. with a pencil of hairs at the tip only, no submarginal cell, no

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*(Extract from the *Annales de la Soc. Entomologique* de France, 1835, p. 683.)

Limnobiorhynchus Westw. fam. *Tipulidæ* Limnobiæ affinis. Corpus elongatum, gracile; caput parvum, oculis magnis; proboscide gracili, cylindricâ, porrectâ, fere longitudine corporis; palpis haud conspicuis; antennæ breves, graciles, ad basin proboscidis insertæ, thorace multo breviores; ♂ 14-articulatæ, articulis 2 basalibus majoribus, reliquis æqualibus oblongo-ovatis; ♀ 12 vel 13 articulatæ brevissimæ, articulis 2 vel 3 basalibus incrassatis, reliquis 10, sensim ad apicem attenuatis; articulis 2 terminalibus setis 6 longissimis penicillum efformantibus, instructis. Prothorax in collum gracilem productus. Alæ iridescentes, haud pilosæ, nervis in alis masculinis fere ut in *Limnobiâ xanthopterâ* Meigenii (Schilling, Beitr. Dipt. Tab. 2, fig. 1) dispositis: in fœminis cellulis marginalibus cum submarginali omnino coalitis (nervo longitudinali illas in ♂ dividente omnino obliterato); in ♂ etiam nubilâ stigmaticalis extat, locum nervi transversi rudimentalis indicante.

Obs. Ex omnibus Tipulideis, adhuc cognitis, differt proboscide longissimâ, inde affinitatem cum Culicideis possidere videtur.

Sp. 1. *Limn. Brazilicnsis* Westw. Pallide luteo-fuscescens, thorace fusco trivittato, postscutello cinerascente; oculis, antennis et proboscide nigris; segmentis abdominalibus ad apicem in ♀ fuscis: pedibus fuscis; tibiarum apice nigro: alis iridescentibus, nervis costalibus fulvescentibus. Long. corp. (proboscide exceptâ) ♂ lin. 3, ♀ lin. 5½. Exp. alar. lin. 6½, 7.

Habitat. apud Bahiam, Braziliæ; in mus. nostro.

Sp. 2. *Limn. canadensis.* Præcedenti valde similis, differt thorace, proboscide, tibiarum apice halteribusque concoloribus, femorum apice infuscato, nervis costalibus fuscescentibus. Long. corp. ♂ lin. (?) ¾. Exp. alar. lin. 7.

Hab in Canada: in mus. nostro.

stigmatical cloud) belong to *Toxorhina*. One of the species described by him, *Limnobiorhynchus canadensis*, of which he knew only the male sex, I have already shown to be an *Elephantomyia*. The other species, *L. braziliensis*, described in both sexes, will have to be erased from the number of known species if my supposition is confirmed, because the female described under that name would belong to *Toxorhina*, and the male would be an *Elephantomyia*, sufficiently resembling the former to be mistaken for the same species, but nevertheless distinguished by a much smaller size, the presence of a stigmatic cloud, a slight difference in the coloring of the abdomen, besides the generic differences already alluded to, all of which are mentioned by Mr. Westwood himself.

Thus the confusion which, for such a long time, was connected with the existence of the genera *Toxorhina* and *Limnobiorhynchus* seems to have reached, or at least, to be very near, its solution! This confusion was principally due to the very striking coincidence that both Westwood and Loew possessed *only males* of a genus with a submarginal cell, and *only females* of another genus without a submarginal cell. Both of these authors were so much struck by the extraordinary prolongation of the proboscis in both genera, that they united them into one, with this difference, however, that Westwood noticed the difference in the neuration and described it as sexual; Loew, on the contrary, entirely overlooked this difference.

The conclusions which we have thus reached are based upon facts which give them a very high degree of probability. The links of evidence which are still wanting are the discovery of the male of *T. fragilis* and of the females of the fossil species. The former would afford us certainty as to the generic identity of *T. fragilis* and *T. magna*; the latter would confirm or disprove the belonging of the fossil species to *Limnobiorhynchus*. As to the supposed non-existence of this latter genus, unless it can be proved or disproved by the production of Westwood's original specimens, we will have to wait for the negative evidence of its non-discovery in future.]

Description of the Species.

1. **T. magna**, n. sp. ☿ ♀.—Thorax fusco-flavescens, vittis tribus fuscis, fronte angusta; alis immaculatis.

Thorax brownish-yellow, with three brown stripes; front narrow: wings immaculate.

Long. corp. 0.5—0.6 (without the proboscis).

Head yellowish-cinereous; front narrow, brownish in the middle; antennæ brown; proboscis brown, about once and a half the length of the head and the thorax taken together. Thorax pale brownish-yellow, almost isabel-yellow, with three brown stripes; the intermediate one is rather broad; its sides are parallel and very well defined; it is slightly capillary on its posterior portion, near the scutellum only; beyond the suture, the thorax, including the scutellum and metanotum, are covered with a dense gray bloom; pleuræ brownish-yellow, with a cinereous bloom. Abdomen reddish-brown. Coxæ yellow; feet brownish tawny; tips of the tibiæ and the tarsi, except the basis of the first joint, brown. Wings hyaline; costal veins yellowish-tawny, the other veins brown; the tip of the auxiliary vein is almost exactly opposite the origin of the second vein; section of the second vein, posterior to the small cross-vein, arcuated; the great cross-vein is at the very basis of the discal cell: the inner discal cross-vein is very oblique: no vestige of a stigma.

Hab.—New Jersey, in July, (Cresson); a male and a female specimen.

Observation.—It is not impossible that the female of *Limnobiorhynchus braziliensis* Westw. is identical with our species, the male, as we have shown above, probably belonging to a different genus. Westwood's description (compare it above) is, however, too short to admit of identification.

2. **T. muliebris,** n. sp. ♂.—Obscure cinerea, fronte latiore, vittis thoracis obscuris, pedibus pallidis, alis immaculatis.

Dark cinereous, front rather broad, stripes of the thorax blackish, feet pale tawny, wings immaculate.

Long. corp. 0.3.

Head blackish or dark gray; occiput and occipital orbits cinereous; antennæ brownish; basal joints darker; proboscis pale brown. Thorax blackish gray; the usual three stripes are still darker, almost black; they occupy the greater part of the mesonotum; the latter shows, especially on the sides, a yellowish bloom: metanotum blackish, with a gray bloom. Feet, including the coxæ, yellowish: tarsi infuscated from the tip of the first joint. Abdomen blackish; forceps of the male reddish-yellow. Wings hyaline: no vestige of a stigma; costal and first longitudinal veins tawny, the other veins darker brown; the tip of the auxiliary vein is very slightly beyond the origin of the second vein; the section of the second vein, posterior to the small cross-vein, is strongly arcuated; the inner discal cross-vein is very oblique; the great cross-vein is a little before the discal cell.

Hab.—Princeton, Mass. (Scudder); a single male specimen.

Observation.—This species is distinguished from the preceding by its much smaller size, its darker and more gray coloring, and its comparatively broader front. Whether the position of the great cross-vein, which in *T. muliebris* is before the discal cell, is also to be reckoned among the constant characters of the species, is uncertain, as I have but a single specimen. The joints of the flagellum of this species immediately following the stout basal joint, are very short and crowded together; they are more elongated in *T. magna*. The color of the only specimen in my possession is somewhat injured by moisture, especially about the head.

[Mr. Loew's reply to my queries for information about *Triogma* has come too late to be made use of in the text, otherwise it would probably have influenced my views about the location of *T. nodicornis.* Mr. Loew thinks that this species has either to be united to *Cylindrotoma* or to be constituted as a separate genus. He would prefer the former course, because he possesses a Siberian species, *Cylindrotoma nigriventris*, which has the thorax sculptured almost like *T. nodicornis* and the antennal joints of which are somewhat expanded, thus likewise approaching the latter species. Mr. Loew also adverts to the difference in the general appearance, existing between *T. nodicornis* and *T. trisulcata*, the latter being shorter and stouter, and further points out some other differences between them, in which I cannot fully concur. Mr. Loew had but a very small number of specimens of *T. nodicornis* for comparison and he was not aware of some characters, as for instance the structure of the first antennal joint and the frequent absence of the small transverse vein, which this species has in common with *T. exsculpta* and not with *Cylindrotoma americana.* Until I have an opportunity of seeing the European species of *Cylindrotoma* and *Tiogma*, my opinion about the location of *T. nodicornis* will remain unsettled; still, as a provisional arrangement, I would rather prefer the one adopted by me.]

B. Second group: LIMNOBINA CYLINDROTOMÆFORMIA.

Gen. IX. **CYLINDROTOMA.**

Characters.—First longitudinal vein incurved at the tip towards the second and ending in it (and not in the costa); one exterior marginal, a submarginal, a discal and *four* or *five* posterior cells. Antennæ 16-jointed, *joints cylindrical, very elongated.* Eyes bare, separated by a rather broad interval above and below the head. Tibiæ with distinct spurs at the tip. Empodia distinct. Forceps of the male with claw-shaped horny appendages, which, in the state of repose, are folded backwards, like the blade of a penknife, towards the upper side of their basal pieces; a long, narrow, linear lamella, deeply bidentate at the tip, protrudes when the forceps is opened.

Head rather broad posteriorly.

Proboscis very short; *palpi* somewhat elongated, last joint elongated; in *C. americana* it is about equal in length to the two preceding joints taken together.

Antennæ rather long, joints elongated, almost cylindrical, finely pubescent, with short, thin, rather scattered verticils.

Collare moderately developed.

Thorax short, stout.

Feet slender; spurs at the tip of the tibiæ of moderate length; fore coxæ short; empodia distinct; excision at the basis of the last tarsal joint of the male, on the under side, rather small, and this joint not particularly modified.

Abdomen long, slender, conspicuously club-shaped at the tip, in the male; the *ovipositor* of the female, which I have not had occasion to examine, consists, according to Dr. Schiner, of four foliaceous valves, which in *C. distinctissima* have a very complicated structure. It seems, however, that this ovipositor belongs to the type of structure common to the whole group of *Cylindrotomina*.

The *neuration* of the wings is, in several respects, different from that of the other *Limnobina;* the auxiliary vein stops short abruptly, and is somewhat indistinctly connected near its tip with the first longitudinal vein; the latter, instead of ending in the costa, is incurved towards the second longitudinal vein and ends in it; a more or less indistinct cross-vein connects it with the costa; the second longitudinal vein forms with the third a fork, neither of the branches of which is in a straight line with the inner section of the second vein; (a different structure of this fork characterizes *Phalacrocera*); the small cross-vein is always present and not rendered obsolete, as in *Triogma*, by the contact of the submarginal with the discal cell; of the three veins emitted by the discal cell towards the margin of the wing, the anterior one in the European *C. distinctissima* and in *C. americana* has a branch-vein, enclosing one more posterior cell, of which these species have thus *five* instead of *four*. The European *C. glabrata* has no such branch-vein, and consequently, only *four* posterior cells. Still, if we judge by Dr. Schiner's expression, that there are *usually* five posterior cells in *C. distinctissima* and *four* in *C. glabrata*, it would seem that this character is not altogether constant. In *C. americana* the discal cell is very much extended on the inside beyond the small cross-vein, towards the basis of the wing; this does not seem to be the case with the European *C. distinctissima*.

The differences between this genus and the two following will be explained under the head of the latter. The relationship of the whole group to *Tipula* and *Ptychoptera* has been developed above, in the general remarks on the *Limnobina anomala*.

The genus *Cylindrotoma* was proposed by Macquart in 1834 (*Suites à Buffon*, *Diptères*, I, p. 107) for *Limnobia distinctissima*, *Limnophila macrocera* Say and a *Limnobia macroptera*, which seems to be an *Ula*. Later (*Dipt. Exot.* I, 1, p. 67) he added to it *Limnobia erythrocephala* Wied. and *L. acrostacta* Wied., neither of which are *Cylindrotomæ*. This mixture of species belonging to quite different genera proves how little Macquart understood the peculiarities of the species *C. distinctis-*

sima which he proposed as the type of the genus. The cylindrical shape of the joints of the antennæ was the only distinctive character on which he established the genus. Zetterstedt (1851) and Walker (1856) gave a more complete definition of the genus, to which Schiner (1863) assigned its true position, by showing its relationship with *Triogma trisulcata* and *Phalacrocera nudicornis.*

Three or four European and one North American species of *Cylindrotoma* are at present known. Mr. Loew could distinguish in 1850 at least six fossil species included in amber. (Loew, Bernstein u. Bernsteinfauna, 1850, p. 37.)

The habits of this genus are very curious; the larva lives on the under side of the leaves of certain plants, as *Anemone, Viola, Stellaria.* It is green and has a crest along its back, formed by a row of fleshy processes. It was first discovered and figured by Schellenberg (*Genres des Mouches Diptères* in 1803), a circumstance which seems to have been overlooked since.

The name of the genus is derived from the word cylinder and the verb τεμνω, I cut, in allusion to the cylindrical joints of the antennæ.

1. **C. americana** n. sp. ♂.—Flava, capite flavo, thorace nigro-fasciato, antennarum articulis subcylindricis, elongatis: cellulis posterioribus quinque.

Yellow, head yellow, thorax striped with black, antennæ with subcylindrical, elongated joints; five posterior cells.

Long. corp. 0.45.

Head pale yellow, rounded and but little attenuated posteriorly; a pale brown spot on the vertex; palpi brown; the antennæ, if extended backwards, would reach the end of the second abdominal segment; two basal joints pale yellow, the first not much longer than the second; third joint yellow at the extreme basis only, elongated, cylindrical; the following joints a little shorter than the third, elongated, subcylindrical, slightly attenuated at the basis; they are nearly of the same length to the end of the antenna; the flagellum is clothed on both sides with a delicate and dense pubescence, among which some longer, but also very delicate verticils are scattered. Thorax pale yellow, opaque above, with a black, opaque stripe in the middle, reaching from the scutellum to the collare and divided longitudinally by a very narrow yellow line; the lateral stripes are dark brown, sometimes pale brown, abbreviated anteriorly and reaching beyond the suture posteriorly; a brown spot on the pleuræ, between the root of the wings and the collare and another brown spot on each side of the pectus, between the first and second pair of coxæ; halteres pale, dusky at tip; feet yellow, tarsi brown towards the tip. Abdomen brownish-yellow, darker along the lateral margins; its tip (in the male) is rather stout, club-shaped. Wings hyaline, very slightly tinged with yellowish-cinereous; stigma short, pale; the inner and outer section of the second vein are almost of equal length; the first vein ends in the second at about the middle of the outer section of the latter; submarginal cell a little longer than the first posterior; small cross-vein short; discal cell rather large, elongated; its inner end pointed and nearer to the basis of the wing than the inner end of the submarginal cell; the outer end of the discal cell emits four veins towards the margin: the anterior among these veins is very arcuated at its basis, so that the cell it frames in seems to be carved out of first posterior cell: great cross-vein somewhat beyond the basis, but before the middle, of the discal cell; fifth longitudinal vein incurved at the tip. More structural details about this species have been given among the generic characters.

Hab.—White Mountains, N. H., end of June, 1836 (*nob.*); two male specimens.

Observation.—I will mention here some peculiarities of the structure of the thorax of this species, which I have omitted in its description, as unimportant for its recognition. The thoracic transverse structure is marked by a very delicate groove in the shape of a Y or of a fork, the two ends of which run parallel towards the collare and the handle reaches the scutellum; a transverse impression on each side connects this fork with the sides of the thorax, near the root of the wings and thus completes the transverse suture. These slender grooves on the thoracic dorsum foreshadow the more distinct sculpture of *Triogma*. The scutellum in both genera has two distinct pits near its basis.

The European *C. distinctissima* seems to be very like *C. americana* in its coloring.

Gen. X. **TRIOGMA.**

Characters.—First longitudinal vein incurved at the tip towards the second and ending in it (and not in the costa): one exterior marginal, a submarginal, a discal and four posterior cells; *the small cross-vein is often wanting*, the submarginal cell, near its basis, being in immediate contact with the discal cell. Antennæ 16-jointed: *joints short-oval or heart-shaped.* Eyes bare, separated by a rather broad interval above and below. Tibiæ with distinct spurs at the tip. Empodia distinct. Forceps of the male analogous to that of *Cylindrotoma*: a style or aculeus, three-lobed at the tip, is always present, often concealed, sometimes projecting. The ovipositor of the female has short, broad valves, obtuse at the tip.

Head but moderately narrowed posteriorly and rather closely applied to the collare.

Proboscis very short; *palpi* of moderate length or rather short; last joint elongated.

The *antennæ* of the European *T. trisulcata* and the American *T. exsculpta* have short-oval, almost rounded joints of the flagellum; in *T. nodicornis* the flagellum is moniliform, the joints being almost heart-shaped and connected by short pedicels; the last joint of *T. nodicornis* has a cylindrical prolongation which may be easily taken for a 17th-joint; the verticils are short.

Collare moderately developed, in the shape of a transverse fold.

The *thorax* of the three species at present known is sculptured in a manner quite unusual in the *Tipularia* and even among the *Diptera* in general; there is a more or less distinct groove running from the collare backwards, along the middle of the mesonotum; on each side of it there is a densely rugoso-punctate stripe; the upper part of the metanotum is also densely rugoso-punctate.

Feet rather strong, fore coxæ short; spurs at the tip of the tibiæ of moderate length; empodia large, distinct; last joint of the tarsi in the male moderately excised at the basis on the under side and its shape not modified.

The *male* and *female genitals* are very much like those of *Cylindrotoma;* to the basal pieces of the male forceps is fastened, on each side, a claw-shaped horny appendage, which in repose is folded backwards, and closely applies to the upper part of the basal piece. The large horny lamella or aculeus existing between the two halves of the forceps, is somewhat differently shaped here; it consists of three long, slender, horny styles, connate at their bases and separate from each other towards their tips; these tips are incrassated; (in *Cylindrotoma* the three styles are connate on their whole length, thus forming a lamella which is tridentate at the tip). This lamella or aculeus is thrown out when the forceps opens, and often, but not always, remains in this position in dry specimens. This description of the forceps refers to *T. nodicornis*, which I have observed in the living state; but judging from Dr. Schiner's short description of the forceps of *T. trisulcata*, it must have a somewhat similar structure. Of *T. exsculpta* I know the female sex only; the valves of the ovipositor both of this species and of *Triogma nodicornis* are short and broad.

The principal feature of the *neuration*, the course of the first longitudinal vein, which does not end in the costa, but is incurved at its tip towards the second vein, is the same here as in *Cylindrotoma.* The auxiliary vein ends abruptly at the inner end of the stigma and has but an indistinct connection with the first longitudinal vein. In some specimens, a slight vestige of an oblique cross-vein connects the latter part of the first vein with the costa. Where this cross-vein does not exist, there is no separation between the marginal and the costal cell. The frequent absence of the small cross-vein seems to be a peculiarity of this genus; the basal part of the submarginal cell thus comes in immediate contact with the discal cell. This character is very frequent, although not altogether constant; *T. trisulcata* and *T. exsculpta* seem usually to possess it; still, among seven specimens of the former, Schummel (*Beitræge etc.* p. 106) observed one which had a small cross-vein, but that on one wing only; with *T. nodicornis* this exception seems to be more frequent, as among *fifteen* specimens which I have before me.

four have a small cross-vein. The three known species of *Triogma* have only four posterior cells.

The relationship of *Triogma* and *Cylindrotoma* is very great, and the principal differences consist in the structure of the antennæ and the frequent absence of the small cross-vein in the former genus. The general appearance of *Triogma* is heavier than that of *Cylindrotoma*, the feet are stouter, the abdomen less slender at the basis, but also (in the male) less club-shaped at the tip; the first antennal joint of *C. americana* is not much longer than the second, whereas it is distinctly longer in *Triogma*.

This genus was proposed by Dr. Schiner in 1863 for the European *Limnobia trisulcata* Schummel; a precisely analogous form is the North American *Triogma exsculpta*. *T. nodicornis* is somewhat more like *Cylindrotoma* in its coloring and its general appearance; still the sculpture of its thorax and the frequent absence of the small cross-vein on its wings apparently refer it here, unless, on account of the peculiar structure of its antennæ, we establish a separate genus for it; this, according to my opinion, would be altogether useless. These three species are the only ones of the genus at present known.

The name of the genus is derived from τρεῖς, three, and ὀγμὸς, furrow, in allusion to the thoracic furrows.

Description of the Species.

1. **T. exsculpta**, n. sp. ♀.—Fusca, alis infuscatis; thorace sulco medio impresso; vittis ejus lateralibus, capite metanotique parte anteriore rugoso-punctatis.

Brown, wings tinged with brownish; thorax with an impressed groove in the middle; head, lateral stripes, and the anterior part of the metanotum, rugoso-punctate.

Long. corp. 0.37.

Whole body dull brown; front and vertex rugoso-punctate, with a longitudinal furrow in the middle; palpi brown; antennæ, basal joints brown, flagellum paler, joints of the latter sub-ovate. Thorax with a deep longitudinal furrow in the middle; the lateral stripes are marked by a deep, irregular punctation; from the anterior part of these rugoso-punctate stripes a similar punctation extends backwards, along the sides of the mesonotum; the anterior part of the metanotum is deeply rugoso-punctate, and some parts of the pleuræ are also punctate. Halteres dingy brownish-tawny; coxæ brown, feet tawny, clothed with black hairs. Abdomen brown. An indistinct cross-vein connects the latter part of the first longitudinal vein with the costa; the basal part of the submarginal cell is in contact with the discal cell, so that there is no room for a small cross-vein; the discal cell is elongated, quadrangular.

Hab.—Pennsylvania (Cresson); a single female specimen.

2. **T. nodicornis**, n. sp. ♂ ♀.—Obscure flava, capite nigro, thorace nigro-vittato, antennis moniliformibus, articulis earum brevibus, subcordiformibus.

Dark yellow, head black, thorax with black stripes, antennæ moniliform, their joints short, almost heart-shaped.

Long. corp. 0.4—0.42.

Head black, shining: palpi brownish; antennæ dark brown, reaching a little beyond the basis of the abdomen in the male and somewhat shorter in the the female; two basal joints and the basis of the third brownish-yellow; first joint cylindrical, of moderate length; the second short; joints of the flagellum, especially the middle ones, are not much longer than broad, expanded on the under side so as to appear almost heart-shaped, and connected by short pedicels, so as to make the antenna appear moniliform; the last joint is abruptly narrower than the preceding and about twice its length, subcylindrical; it shows a coarctation in the middle, which is more apparent in some (fresh) specimens than in others, and then the antennæ may be taken for 17-jointed: in the *female*, the joints of the flagellum are much less expanded, and only seven or eight intermediate joints have a strikingly heart-shaped appearance; towards the tip, they become gradually narrower; in both sexes, the antennæ are clothed with a soft, dense pubescence, much denser on the under side, and much more striking in the male than in the female; besides, each joint has about the middle several verticils. Thorax honey-yellow, with three black, shining, often confluent stripes; pectus between the first and second pairs of coxæ, black, shining; this black coloring is extended upwards, across the pleuræ, in the shape of a black, but not shining stripe; a black, opaque spot near the base of the halteres, aciculate on its surface; metanotum, or at least its posterior part, black, its surface rugose: (very dark specimens, with confluent thoracic stripes, have all these spots and stripes darker and more extended: those specimens, on the contrary, which have the thoracic stripes separated by yellow, especially towards the scutellum, have also the other black marks smaller in extent and paler in coloring, often pale brown, and the pectus is black on the sides only, yellow in the middle). A well marked groove extends from the scutellum along the middle of the intermediate stripe, and is interrupted long before reaching the collare; the intervals between the intermediate and the lateral stripes are rugoso-punctate. Halteres pale, knob dusky. Feet brownish-yellow; tip of the femora, of the tibiæ, and of the two first tarsal joints, infuscated: two or three last tarsal joints brown. Abdomen brownish, last segments darker, venter paler; genitals brownish-yellow. Wings tinged with brownish-cinereous; stigma elliptical, brownish; inner and outer sections of the second vein of almost equal length, the latter perhaps somewhat longer: submarginal cell longer than the first posterior; discal cell of variable, generally of moderate size, nearly quadrangular; four posterior cells; position of the great cross-vein variable, sometimes a little before, sometimes a little beyond the basis of the discal cell: the small cross-vein is usually wanting, that is, the basis of the submarginal cell is more or less contiguous to the basis of the discal cell; the extent of this contiguity is variable in different specimens: sometimes the small cross-vein is present, but then it is short; (among fifteen specimens which I have before me, only four have the cross-vein); the fifth longitudinal vein is incurved at its tip.

Hab.—Washington, D. C.; New York; White Mountains, N. H. (*nob.*); Illinois (LeBaron); New Jersey (Cresson). Not rare in May and June.

Observation.—The aculeus of the male forceps is very often projecting in the dry specimens of this species. It consists, as already observed, of three horny, slender styles, connate at the basis, separate and somewhat club-shaped at the tip.

Gen. XI. PHALACROCERA.*

[This is another portion of my manuscript which was left unfinished, as I was expecting Mr. Loew's opinion about the location in this genus of the following species. It agrees with *Phalacrocera* Schiner, (l. c. II, p. 561) in all respects, with the exception that in the European *P. nudicornis* the first longitudinal vein *takes the usual course and is not incurved towards the second*, as is the case with *P. tipulina* and with the other *Limnobina cylindrotomæformia*. This difference, if it is a constant one, and if it really exists as stated, would be important. Under such circumstances, the location of the following species in this genus should be considered as only provisional. The antennæ of *Phalacrocera nudicornis*, rather incompletely described in Dr. Schiner's work, are exactly like those of *P. tipulina*, as I had occasion to ascertain through the kindness of Dr. Schiner himself.]

P. tipulina n. sp. ♂.—Fuscescens, capite et thorace supra obscure cinereis, hoc obsolete vittato, pleuris canis; antennarum articulis subcylindricis, elongatis; cellulis posterioribus quatuor.

Brownish; head and thorax dark cinereous above, the latter with obsolete stripes; antennæ with subcylindrical, elongated joints; four posterior cells.

Long. corp. 0.55.

Head considerably narrowed posteriorly, blackish above, with a yellowish-cinereous bloom and a small reddish spot in the middle of the vertex, posteriorly; the under side of the head is brownish; proboscis brownish-yellow; palpi brown; the antennæ, if extended backwards, would reach the end of the second abdominal segment; they are dark brown or black: the first half of the first joint and the basis of the third are reddish; first joint cylindrical, elongated: second short; the third and the following joints are elongated, cylindrical, somewhat incrassated on their anterior half and with the verticils inserted on that incrassation; the flagellum is clothed on both sides with a very short and soft pubescence; (the structure of the antennæ is remarkably like that of some *Tipulæ*). Thorax above with a yellowish-cinereous bloom, concealing the blackish ground color; the latter is more apparent in the place of the usual stripes, whereas the cinereous bloom is more dense in the somewhat impressed intervals between the stripes; pectus black between the first and the second pairs of coxæ and this black color extended upwards, in the shape of a stripe over the pleuræ: a black spot near the basis of the halteres; the remaining portion of the pleuræ brownish-yellow; the whole of the pleuræ are covered with a dense hoary bloom, so that their black portions are visible in a certain light only; collare rather broad, brownish; scutellum and metanotum brownish-yellow, the latter with a yellowish, shining reflection; halteres dusky; coxæ yellowish, with a hoary bloom; femora tawny, yellowish at the basis, and infuscated at the tip: tibiæ brownish, darker at the tip; tarsi brown. Wings with a brownish-cinereous tinge, stigma pale brownish, small, oblong: second longitudinal vein arcuated at the basis; its inner section not much shorter than the third vein, with which it forms a straight line: its outer section forms a knee or a right angle at its basis, usually with a stump of a vein, projecting from this angle; submarginal and first posterior cells precisely of the same length; second posterior cell attenuated at its basis; discal cell elongated, square: great cross-vein inserted before the middle of the discal cell: fifth longitudinal vein inflected at the tip. Although the first longitudinal vein, in this species, as in all the *Cylindrotomæformia* is incurved towards the second, it has, at some distance before the tip, a rather indistinct, slender, oblique cross-vein, connecting it with the costa.

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* φὰλᾶκρὸς, bald.

Hab.—White Mountains, N. H., (*nob.*); two male specimens.

Catalogue of HYMENOPTERA in the Collection of the Entomological Society of Philadelphia, from Colorado Territory.

BY E. T. CRESSON.

(*Communicated March 13th*, 1865.)

The greater part of the collection composing the papers which I propose to publish under the above title, was collected in the mountain region of Colorado Territory, in the summer of 1864, by Mr. James Ridings, and most generously presented to the Entomological Society by Dr. Thomas B. Wilson.

The species are numerous, and most of the families are well represented; many of the species, especially those belonging to the Eumenidæ and Apidæ, are beautifully adorned, and almost too brilliant in their colors to be inhabitants of a climate so temperate as that of the mountain region of Colorado Territory.

Fam TENTHREDINIDÆ.

Genus CIMBEX, Fabr.

Cimbex americana, Leach.

Cimbex americana, Leach, Zool. Miscel. iii, p. 104. Norton, Proc. Ent. Soc. Philad. i, p. 201 (with full synonymy).

One ♂ specimen with hyaline wings.

Genus TRICHIOSOMA, Leach.

Trichiosoma triangulum, Kirby.

Trichiosoma triangulum, Kirby, Fauna Bor.-Am. iv, p. 254. Norton, Proc. Ent. Soc. Philad. iii, p. 5.

Two specimens.

Genus SCHIZOCERUS, Latr.

1. **Schizocerus plumiger**, Klug.

Hylotoma plumigera, Klug, Berlin Magazin, 1814, p. 306.
Cryptus Klugii, Leach, Zool. Miscel. iii, p. 125.